

REMARKS

In response to the Office Action mailed December 19, 2002, the Applicant respectfully requests that the Examiner enter the above amendments and consider the following remarks. A marked-up version of the changes is attached hereto. Claims 1, 7, 10, 17, 19, and 33 have been amended to more clearly describe the invention, and new claims 37 through 44 have been added. As a result, claims 1-44 are pending in the application. The Applicant respectfully requests further examination and reconsideration of the application in light of the amendments and accompanying remarks.

Rejection of Claims 1-36 Under 35 U.S.C. § 103(a)

The Examiner rejected claims 1-36 under 35 U.S.C. § 103(a) as being unpatentable over Keel (US-PAT-NO: 3617480) in view of Yan (USP 4096097) or Grindstaff et al. (US-PAT-NO: 4369171) in view of Yan (USP 4096097). The Applicant respectfully traverses the rejection.

Keel (US-PAT-NO: 3617480) in view of Yan (USP 4096097): Neither Keel nor Yan teaches the use of increased porosity and improved adsorption characteristics of the coke to add chemical compounds to the coke in the quenching portion of the thermal cracking process. First, the Applicant respectfully submits that Keel does not teach a process or method to produce a regular or lower grade petroleum coke having a volatile content of 8-20% by weight, and Keel does not have a claim 6. It appears to the Applicant that the Examiner inadvertently cited the wrong patent. Furthermore, the Applicant respectfully submits that any such combination would not be obvious to one skilled in the art. The combination of green coke (VCM content) and Yan's sponge

coke (vs. shot coke) crystalline structure is submitted to be improper because neither Keel nor Yan suggest such a combination, and one skilled in the art would have no reason to make such a combination. Keel (or, as described by the Examiner, another patent that teaches a green coke having a volatile matter content of 8-20%) does not teach or suggest the addition of at least one chemical compound to the coke in a quench portion of a thermal cracking process. Likewise, Yan does not suggest using carbon adsorption properties of a pet coke without removal from the coke drum and further treatment. In fact, neither Keel nor Yan teach or suggest the use of increased porosity and improved adsorption characteristics of the coke produced to add chemical compounds to the coke in the quenching portion of the thermal cracking process. Accordingly, there is no motivation in the prior art to combine the references as suggested by the Examiner, and the proposed combination of these references still does not teach or suggest every limitation of the present invention. These distinctions of the present invention provide surprising and unexpected results and are patentable under Section 103 because the improved adsorption characteristics of the modified coke allow the integration of various desirable chemical compounds (e.g., sulfur adsorbents, high quality VCM, and oxygen-containing hydrocarbons) during the quench of the thermal cracking process (e.g., delayed coking) which may improve the coke's fuel properties, combustion characteristics, and environmental controls. Therefore, Keel and Yan provide no motivation to combine or modify the references as suggested by the Examiner in order to arrive at the claimed invention.

Grindstaff et al.(US-PAT-NO: 4369171) in view of Yan (USP 4096097):
Neither Grindstaff et al. nor Yan teaches the use of increased porosity and improved

adsorption characteristics of the coke produced to add chemical compounds to the coke in the quenching portion of the thermal cracking process. The Applicant respectfully submits that any combination of Grindstaff et al. and Yan would not be obvious to one skilled in the art. The combination of Grindstaff et al.'s coke (VM content) and Yan's sponge coke (vs. shot coke) crystalline structure is submitted to be improper because neither Grindstaff et al. nor Yan suggest such a combination, and one skilled in the art would have no reason to make such a combination. Grindstaff et al. does not teach or suggest the addition of at least one chemical compound to the coke in a quench portion of a thermal cracking process. Likewise, Yan does not suggest using carbon adsorption properties of the modified coke without removal from the coke drum and further treatment. In fact, neither Grindstaff et al. nor Yan teach or suggest the use of increased porosity and improved adsorption characteristics of the coke produced to add chemical compounds to the coke in the quenching portion of the thermal cracking process. Accordingly, there is no motivation in the prior art to combine the references as suggested by the Examiner, and the proposed combination of these references still does not teach or suggest every limitation of the present invention. These distinctions of the present invention provide surprising and unexpected results and are patentable under Section 103 because the improved adsorption characteristics of the modified coke allow the integration of various desirable chemical compounds (e.g., sulfur adsorbents, high quality VCM, and oxygen-containing hydrocarbons) during the quench of the thermal cracking process (e.g., delayed coking) which may improve the coke's fuel properties, combustion characteristics, and environmental controls.

Therefore, Grindstaff et al. and Yan provide no motivation to combine or modify the references as suggested by the Examiner in order to arrive at the claimed invention.

Since the novel physical features of the applicant's modified petroleum coke provide these new and unexpected results over any reference, the Applicant submits that these new results indicate unobviousness and hence patentability. Therefore, the Applicant respectfully submits that Keel (US-PAT-NO: 3617480) in view of Yan (USP 4096097) or Grindstaff et al. (US-PAT-NO: 4369171) in view of Yan (USP 4096097) cannot support the rejection of claims 1-36 under 35 U.S.C. § 103(a). Accordingly, the Applicant respectfully requests reconsideration and allowance of the present application with the above-amended claims.

Rejection of Claims 1-36 Under Double Patenting Doctrine

The Examiner rejected claims 1-36 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 6,168,709 B1 in view of Yan (USP 4096097). The Applicant respectfully traverses the rejection.

Yan does not teach the use of increased porosity and improved adsorption characteristics of coke to add chemical compounds to the pet coke in the quenching portion of the thermal cracking process. In addition, Yan does not suggest using carbon adsorption properties of the modified coke without removal from the coke drum and further treatment. Furthermore, Yan provides no motivation to combine or modify the references as suggested by the Examiner in order to arrive at the claimed invention.

Therefore, the Applicant respectfully submits that claims 1-21 of U.S. Patent No. 6,168,709 B1 in view of Yan (USP 4096097) cannot support the rejection of claims 1-36 under the obviousness-type double patenting doctrine.

CONCLUSION

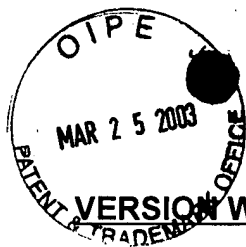
The Applicant has distinguished claims 1-44 over the cited references. Therefore, the Applicant respectfully submits that the present application is now in condition for allowance, and such action is earnestly requested.

Respectfully submitted,

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Jeffrey C. Norris

Jeffrey C. Norris
Registration No. 42,039
Standley & Gilcrest LLP
495 Metro Place South
Suite 210
Dublin, Ohio 43017-5319
Telephone: (614) 792-5555
Fax: (614) 792-5536



VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend the following claims:

1. (amended) A process of producing coke, said method comprising the steps:

(a) obtaining a coke precursor material derived from crude oil and having a volatile organic component; ~~and~~

(b) subjecting said coke precursor material to a thermal cracking process, said thermal cracking process including adding to said coke precursor material at least one additive selected from the group consisting of carbonaceous material and chemical agents, said thermal cracking process performed for sufficient time and at sufficient temperature and under sufficient pressure so as to promote the production of sponge coke having increased porosity and improved adsorption characteristics; ~~and to produce said coke having volatile combustible material (VCM) present in an amount in the range of from about 13% to about 50% by weight;~~

(c) adding at least one chemical compound to said sponge coke in a coke quenching portion of said thermal cracking process wherein the increased porosity and improved adsorption characteristics aid in the addition of said at least one chemical compound.

~~wherein said coke is comprised of sponge coke in an amount in the range of from about 40 to 100% by weight.~~

7. (amended) A process according to claim 1 wherein said chemical agents are selected from the group consisting of plastics, cardboard, ~~and paper,~~ and non-carbonaceous chemicals.

10. (amended) A process according to claim 1 wherein ~~said volatile combustible material in said coke is in the range of from about 45~~ 13 % to about ~~30~~ 50 % by weight.

17. (amended) A process of making coke, said process comprising:

(a) providing a coke feed comprising a material derived from carbonaceous origin;

(b) subjecting said coke feed to a thermal cracking process to promote the production of sponge coke and to produce said coke having increased porosity and improved adsorption characteristics; and~~volatile combustible material (VCM) present in an amount in the range of from about 13% to about 50% by weight;~~

(c) adding at least one chemical compound to said sponge coke in a coke quenching portion of said thermal cracking process wherein the increased porosity and improved adsorption characteristics aid in the addition of said at least one chemical compound~~wherein said coke is comprised of sponge coke in an amount in the range of from about 40 to 100% by weight.~~

19. (amended) A process according to claim 17 wherein ~~said~~ volatile combustible material in said coke is in the range of from about ~~45~~13 % to about ~~30~~50 % by weight.

33. (amended) A process according to claim 26 wherein said chemical agents are selected from the group consisting of plastics, cardboard, ~~and paper,~~ and non-carbonaceous chemicals.

Please add the following new claims:

37. (new) A process according to claim 1 wherein said sponge coke has a surface area of about 600 square meters per gram or greater.

38. (new) A process according to claim 1 wherein said at least one chemical compound is selected from the group consisting of hydrocarbons, oxygen compounds, and sulfur sorbents.

39. (new) A coke made in accordance with a process according to claim 38.

40. (new) A process according to claim 10 wherein said volatile combustible material in said coke is in the range of from about 15% to about 30% by weight.

41. (new) A process according to claim 17 wherein said sponge coke has a surface area of about 600 square meters per gram or greater.

42. (new) A process according to claim 17 wherein said at least one chemical compound is selected from the group consisting of hydrocarbons, oxygen compounds, and sulfur sorbents.

43. (new) A coke made in accordance with a process according to claim 42.

44. (new) A process according to claim 19 wherein said volatile combustible material in said coke is in the range of from about 15% to about 30% by weight.